

## **ATTACHMENT TO RESOLUTION NO. R8-2007- 00XX24**

*(NOTE: The language identified below is proposed to be inserted into Chapter 5 of the Basin Plan. If the amendment is approved, corresponding changes will be made to the Table of Contents, the List of Tables, page numbers, and page headers in the plan. Due to the two-column page layout of the Basin Plan, the location of tables in relation to text may change during final formatting of the amendment. In order to accommodate other new TMDLs adopted as Basin Plan amendments and to maintain their order by watershed, the table and figure identifiers may be modified in future formatting of the Basin Plan for re-publication purposes. However, no substantive changes to the tables/figures would occur absent a Basin Plan Amendment.)*

### **Chapter 5 - Implementation Plan, Discussion of Newport Bay Watershed (page 5-39 et seq), add the following to 4. Toxics Substances Contamination**

#### **4.b Organochlorine Compounds TMDLs**

Organochlorine compounds, including DDT, PCBs, toxaphene and chlordane, possess unique physical and chemical properties that influence their persistence, fate and transport in the environment. While these characteristics vary among the organochlorine compounds, they all exhibit an ability to resist degradation, partition into sediment, and to accumulate in the tissue of organisms, including invertebrates, fish, birds and mammals. The bioaccumulation of these compounds can adversely affect the health and reproductive success of aquatic organisms and their predators, and can pose a health threat to human consumers.

A TMDL technical report prepared by Regional Board staff [Ref. # 1] describes organochlorine-related problems in Newport Bay and its watershed and delineates the technical basis for the TMDLs that follow.

The waterbody-pollutant combinations for which organochlorine compounds TMDLs were established by the Regional Board are listed in Table NB-OCs-1. These TMDLs differ from those established by USEPA in 2002 in several respects:

First, based on an updated impairment assessment that utilized new data and applied the State Water Board's "Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) list" (2004) [Ref. # 2], the Regional Board established TMDLs for a list of organochlorine compound-waterbody combinations different from that of USEPA. As shown in Table NB-OCs-2, USEPA also established TMDLs for dieldrin, chlordane, and PCBs in San Diego Creek and for dieldrin in Lower Newport Bay. In contrast, the Regional Board found no impairment as the result of dieldrin in any of these waters, nor was impairment due to chlordane or PCBs found in San Diego Creek and its tributaries.

As described in the TMDL technical report, Regional Board staff also found no impairment due to DDT in San Diego Creek or its tributaries. However, in adopting the 2006 Section 303(d) list (October 25, 2006, Resolution No. 2006-0079), the State Water Board found impairment due to DDT in Peter's Canyon Channel. In response, the Regional Board established a TMDL for DDT in San Diego Creek and its tributaries, including Peters Canyon Channel.

Second, corrections and modifications were made to loading capacities and existing loads identified in USEPA's TMDLs. Finally, an implementation plan is specified (see Section 4.b.3).

While the Regional Board did not establish TMDLs for chlordane and PCBs for San Diego Creek and tributaries, the Board did develop informational TMDLs for these substances in these waters, pursuant to Clean Water Act Section 303(d)(3). These informational TMDLs are shown in Table NB-OCs-3. This action was taken in light of several factors. First, the largest source of organochlorine compounds to Newport Bay is San Diego Creek. Second, the data suggest that the existing loading of chlordane to the creek is greater than the loading capacity. This suggests that the lack of finding of impairment due to chlordane may be simply a reflection of a lack of data with which to assess impairment. Finally, these informational TMDLs may forward action to address organochlorine compound problems in the watershed. These informational TMDLs have no regulatory effect but may be used as the basis for further investigation of the relative contributions of the various sources of organochlorine compound inputs to San Diego Creek and thence the Bay. In the long-term, this would be expected to help assure proper apportionment of responsibility for implementation of the TMDLs identified in Table NB-OCs-1.

**Table NB-OCs-1. Waterbody-pollutant combinations for which Organochlorine Compound TMDLs are established**

| <b>Waterbody</b>                | <b>Pollutant</b>     |
|---------------------------------|----------------------|
| San Diego Creek and tributaries | DDT, Toxaphene       |
| Upper Newport Bay               | Chlordane, DDT, PCBs |
| Lower Newport Bay               | Chlordane, DDT, PCBs |

**Table NB-OCs-2. Waterbody-pollutant combinations for which Organochlorine Compounds TMDLs were established by USEPA (2002) and Regional Board (2007)**

| <b>Waterbody</b>                 | <b>TMDLs</b>                              |                       |
|----------------------------------|---|-----------------------|
|                                  | <b>USEPA</b>                              | <b>Regional Board</b> |
| San Diego Creek and tributaries* | Chlordane, dieldrin, DDT, PCBs, Toxaphene | DDT, Toxaphene        |
| Upper Newport Bay                | Chlordane, DDT, PCBs                      | Chlordane, DDT, PCBs  |
| Lower Newport Bay                | Chlordane, dieldrin, DDT, PCBs            | Chlordane, DDT, PCBs  |

\*TMDLs are established for San Diego Creek and tributaries, even if impairment was only found in particular reaches (e.g., SWRCB found DDT impairment in Peter's Canyon Channel, a primary tributary to San Diego Creek Reach 1, but the TMDL includes all of San Diego Creek and tributaries).

**Table NB-OCs-3. Informational TMDLs**

| <b>Waterbody</b>                | <b>Informational TMDLs</b> |
|---------------------------------|----------------------------|
| San Diego Creek and tributaries | Chlordane, PCBs            |

#### 4.b.1 Numeric Targets used in Organochlorine Compounds TMDLs

Numeric targets identify specific endpoints in sediment, water column or tissue that equate to attainment of water quality standards, which is the purpose of TMDLs. Multiple targets may be appropriate where a single indicator is insufficient to protect all beneficial uses and/or attain all applicable water quality objectives. The range of beneficial uses identified in this Basin Plan (see Chapter 3) for the waters addressed by the organochlorine compounds TMDLs makes clear that the targets must address the protection of aquatic organisms, wildlife (including federally listed threatened and endangered species) and human consumers of recreationally and commercially caught fish.

Sediment, water column and fish tissue targets are identified for these TMDLs, as shown in Table NB-OCs-4. The sediment and water column targets are identical to those selected by USEPA in the development of their organochlorine compounds TMDLs (2002). Fish tissue targets are added for the protection of aquatic life and wildlife.

The targets employed in the development of informational TMDLs for chlordane and PCBs in San Diego Creek and its tributaries are shown in Table NB-OCs-5.

**Table NB-OCs-4. Numeric Sediment, Fish Tissue, and Water Column TMDL Targets**

|  | Total DDT | Chlordane | Total PCBs | Toxaphene |
|--|-----------|-----------|------------|-----------|
| <b>Sediment Targets<sup>1</sup>; units are µg/kg dry weight</b>  |           |           |            |           |
| San Diego Creek and tributaries  | 6.98      |           |            | 0.1       |
| Upper & Lower Newport Bay  | 3.89      | 2.26      | 21.5       |           |
| <b>Fish Tissue Targets for Protection of Human Health<sup>2</sup>; units are µg/kg wet weight</b>              |           |           |            |           |
| San Diego Creek and tributaries  | 100       |           |            | 30        |
| Upper & Lower Newport Bay  | 100       | 30        | 20         |           |
| <b>Fish Tissue Targets for Protection of Aquatic Life and Wildlife<sup>3</sup>; units are µg/kg wet weight</b> |           |           |            |           |
| San Diego Creek and tributaries  | 1000      |           |            | 100       |
| Upper & Lower Newport Bay  | 50        | 50        | 500        |           |
| <b>Water Column Targets for Protection of Aquatic Life, Wildlife &amp; Human Health<sup>4</sup> (µg/L)</b>     |           |           |            |           |
| San Diego Creek and tributaries  |           |           |            |           |
| <i>Acute Criterion (CMC)</i>   | 1.1       |           |            | 0.73      |
| <i>Chronic Criterion (CCC)</i>   | 0.001     |           |            | 0.0002    |
| <i>Human Health Criterion</i>  | 0.00059   |           |            | 0.00075   |
| Upper & Lower Newport Bay  |           |           |            |           |
| <i>Acute Criterion (CMC)</i>   | 0.13      | 0.09      |            |           |
| <i>Chronic Criterion (CCC)</i>   | 0.001     | 0.004     | 0.03       |           |
| <i>Human Health Criterion</i>  | 0.00059   | 0.00059   | 0.00017    |           |

<sup>1</sup>Freshwater and marine sediment targets, except toxaphene, are TELs from Buchman, M.F. 1999. NOAA Screening Quick Reference Tables, NOAA HAZMAT Report 99-1, Seattle WA, Coastal Protection and Restoration Division, National Oceanic and Atmospheric Administration, 12 pp. Toxaphene target is from N.Y. Dept. of Environmental Conservation.

<sup>2</sup>Freshwater and marine fish tissue targets for protection of human health are OEHHA SVs.

<sup>3</sup>Freshwater and marine fish tissue targets for protection of aquatic life and wildlife are from Water Quality Criteria 1972. A report of the Committee on Water Quality Criteria, Environmental Studies Board, National Academy of Sciences, National Academy of Engineering. Washington, D.C., 1972.

<sup>4</sup>Freshwater and marine targets are from California Toxics Rule (2000).

**Table NB-OCs-5. Numeric Sediment, Fish Tissue, and Water Column Targets used in Informational TMDLs**

|  | Chlordane | Total PCBs |
|--|-----------|------------|
| <b>Sediment Targets<sup>1</sup>; units are µg/kg dry weight</b>  |           |            |
| San Diego Creek and tributaries  | 4.5       | 34.1       |
| <b>Fish Tissue Targets for Protection of Human Health<sup>2</sup>; units are µg/kg wet weight</b>              |           |            |
| San Diego Creek and tributaries  | 30        | 20         |
| <b>Fish Tissue Targets for Protection of Aquatic Life and Wildlife<sup>3</sup>; units are µg/kg wet weight</b> |           |            |
| San Diego Creek and tributaries  | 100       | 500        |
| <b>Water Column Targets for Protection of Aquatic Life, Wildlife &amp; Human Health<sup>4</sup> (µg/L)</b>     |           |            |
| San Diego Creek and tributaries  |           |            |
| <i>Acute Criterion (CMC)</i>   | 2.4       |            |
| <i>Chronic Criterion (CCC)</i>   | 0.0043    | 0.014      |
| <i>Human Health Criterion</i>  | 0.00059   | 0.00017    |

<sup>1</sup>Freshwater sediment targets are TELs from Buchman, M.F. 1999. NOAA Screening Quick Reference Tables, NOAA HAZMAT Report 99-1, Seattle WA, Coastal Protection and Restoration Division, National Oceanic and Atmospheric Administration, 12 pp.

<sup>2</sup>Freshwater fish tissue targets for protection of human health are OEHHA SVs.

<sup>3</sup>Freshwater fish tissue targets for protection of aquatic life and wildlife are from Water Quality Criteria 1972. A report of the Committee on Water Quality Criteria, Environmental Studies Board, National Academy of Sciences, National Academy of Engineering. Washington, D.C., 1972.

<sup>4</sup>Freshwater targets are from California Toxics Rule (2000).

The linkage between adverse effects in sensitive wildlife species and concentrations of the organochlorine pollutants in sediments, prey organisms and water is not well understood at the present time, although work is underway to better understand ecological risk in Newport Bay. In addition, the State is in the process of developing sediment quality objectives that should provide guidance for assessing adverse effects due to pollutant bioaccumulation. Reducing contaminant loads in the sediment will result in progress toward reducing risk to aquatic life and wildlife. During implementation of these TMDLs, additional and/or modified wildlife or other targets will be identified as risk assessment information becomes available. These TMDLs will be revisited (see 4.b.3) and revised as appropriate.

#### **4.b.2. Organochlorine Compounds TMDLs, Wasteload Allocations, Load Allocations and Compliance Dates**

The organochlorine compounds TMDLs for San Diego Creek and its tributaries, Upper Newport Bay and Lower Newport Bay are shown in Tables NB-OCs-6 and NB-OCs-7. The TMDLs are expressed on a daily basis (average grams per day) in Table NB-OCs-6, and on an annual basis (grams per year) in Table NB-OCs-7. Expression of the TMDLs on a daily basis is intended to comply with a relevant court decision. However, because of the strong seasonality associated with the loading of organochlorine compounds during storm events, it is appropriate for implementation to occur based on average annual loadings. The TMDLs are to be achieved as soon as possible but no later than December 31, 2015.

***Table NB-OCs-6. TMDLs for San Diego Creek, Upper and Lower Newport Bay (expressed on a “daily” basis to be consistent with the D.C. Circuit Court of Appeals decision in Friends of the Earth, Inc. v. EPA, et al., No. 05-5015 [D.C. Cir.2006]).***

| <b>Water Body</b>                  | <b>Pollutant</b> | <b>TMDL<br/>(average grams per day)<sup>a</sup></b> |
|------------------------------------|------------------|---|
| San Diego Creek<br>and Tributaries | Total DDT        | 1.08  |
|                                    | Toxaphene        | 0.02  |
| Upper Newport Bay                  | Total DDT        | 0.44  |
|                                    | Chlordane        | 0.25  |
|                                    | Total PCBs       | 0.25  |
| Lower Newport Bay                  | Total DDT        | 0.16  |
|                                    | Chlordane        | 0.09  |
|                                    | Total PCBs       | 0.66  |

<sup>a</sup>Compliance to be achieved as soon as possible but no later than December 31, 2015.

**Table NB-OCs-7. TMDLs for San Diego Creek, Upper and Lower Newport Bay (expressed on annual basis for implementation purposes)**

| Water Body                      | Pollutant  | TMDL<br>(grams per year) <sup>a</sup> |
|---------------------------------|------------|---------------------------------------|
| San Diego Creek and Tributaries | Total DDT  | 396                                   |
|                                 | Toxaphene  | 6                                     |
| Upper Newport Bay               | Total DDT  | 160                                   |
|                                 | Chlordane  | 93                                    |
|                                 | Total PCBs | 92                                    |
| Lower Newport Bay               | Total DDT  | 59                                    |
|                                 | Chlordane  | 34                                    |
|                                 | Total PCBs | 241                                   |

<sup>a</sup>Compliance to be achieved as soon as possible but no later than December 31, 2015.

Informational TMDLs for San Diego Creek and its tributaries for chlordane and total PCBs are shown in Table NB-OCs-8. Again these informational TMDLs are expressed on an average daily and annual basis.

**Table NB-OCs-8. Informational TMDLs for San Diego Creek and Tributaries (expressed on average daily and annual basis)**

| Water Body                      | Pollutant  | TMDL<br>(average grams per day)  |
|---------------------------------|------------|----------------------------------|
| San Diego Creek and Tributaries | Chlordane  | 0.70                             |
|                                 | Total PCBs | <del>0.31</del> <b>0.34</b>      |
|                                 |            | <b>TMDL<br/>(grams per year)</b> |
| San Diego Creek and Tributaries | Chlordane  | 255                              |
|                                 | Total PCBs | <del>114</del> <b>125</b>        |

Wasteload and load allocations to achieve the TMDLs specified in Tables NB-OCs-6 and NB-OCs-7 are shown in Tables NB-OCs-9 and NB-OCs-10, respectively. Like the TMDLs, the allocations are expressed in terms of both average daily and annual loads. An explicit margin of safety (MOS) of ten percent was applied in calculating the allocations. Consistent with the TMDL compliance schedule, these allocations are to be achieved as soon as possible but no later than December 31, 2015.

Wasteload and load allocations necessary to meet the informational TMDLs shown in Table NB-OCs-8 are identified in Tables NB-OCs-11 (expressed as average daily loads) and NB-OCs-12 (expressed as annual loads). These allocations are identified only for informational purposes.

#### **4.b.3. Implementation of Organochlorine Compounds TMDLs**

The implementation plan identified in this section reflects the phased approach to the organochlorine compound TMDLs adopted by the Regional Board. The Board found a phased approach, with compliance schedules, appropriate in light of the following considerations. First, it was recognized that additional monitoring and special studies were either already underway or would be needed to address data limitations and significant uncertainty associated with the TMDL calculations, and that changes to the TMDLs might be appropriate based on the results of those investigations. Second, it was also understood that these data limitations and uncertainties pertained to the impairment assessment itself and the determination of the specific organochlorine compounds for which TMDLs are required. Third, the natural attenuation of these compounds over time is expected to affect significantly the selection, development and implementation of TMDLs. As described in the TMDL technical report [Ref.1], use of the organochlorine compounds addressed by these TMDLs has been banned for many years and trend analyses indicate declining concentrations of these substances in fish tissue over time. Natural attenuation should eventually reduce organochlorine pollutant levels to concentrations that pose no threat to beneficial uses in San Diego Creek or Newport Bay. While natural degradation of these compounds is likely the principal cause of the observed decline in fish tissue concentrations, the implementation of erosion and sediment controls and other Best Management Practices to address compliance with the sediment and nutrient TMDLs for Newport Bay and its watershed (see discussions of these TMDLs elsewhere in this Basin Plan) is a probable factor. In any case, the observed trends suggest that as monitoring continues in the



**Table NB-OCs-9. TMDLs and Allocations for San Diego Creek, Upper and Lower Newport Bay (expressed on a “daily” basis to be consistent with the recent D.C. Circuit Court of Appeals decision in Friends of the Earth, Inc. v. EPA, et al., No. 05-5015 [D.C. Cir.2006]).<sup>a,b</sup>**

|                            |   | Total DDT           | Chlordane | Total PCBs | Toxaphene |
|----------------------------|---|---------------------|-----------|------------|-----------|
| Type                       |   | (average grams/day) |           |            |           |
| San Diego Creek            |   |                     |           |            |           |
| WLA                        | Urban Runoff – County MS4 (36%)                     | 0.35                |           |            | 0.005     |
|                            | Construction (28%)                                  | 0.27                |           |            | 0.004     |
|                            | Commercial Nurseries (4%)                           | 0.04                |           |            | 0.001     |
|                            | Caltrans MS4 (11%)                                  | 0.11                |           |            | 0.002     |
|                            | Subtotal – WLA (79%)                                | 0.77                |           |            | 0.01      |
| LA                         | Agriculture (5%)<br>(excludes nurseries under WDRs) | 0.05                |           |            | 0.001     |
|                            | Open Space (9%)                                     | 0.09                |           |            | 0.001     |
|                            | Streams & Channels (2%)                             | 0.02                |           |            | 0.0003    |
|                            | Undefined (5%)                                      | 0.05                |           |            | 0.001     |
|                            | Subtotal – LA (21%)                                 | 0.21                |           |            | 0.003     |
| MOS<br>(10% of total TMDL) |   | 0.11                |           |            | 0.002     |
| Total TMDL                 |   | 1.08                |           |            | 0.02      |
| Upper Newport Bay          |   |                     |           |            |           |
| WLA                        | Urban Runoff - County MS4 (36%)                     | 0.14                | 0.08      | 0.08       |           |
|                            | Construction (28%)                                  | 0.11                | 0.06      | 0.06       |           |
|                            | Commercial Nurseries (4%)                           | 0.02                | 0.01      | 0.01       |           |
|                            | Caltrans MS4 (11%)                                  | 0.04                | 0.03      | 0.02       |           |
|                            | Subtotal – WLA (79%)                                | 0.31                | 0.18      | 0.18       |           |
| LA                         | Agriculture (5%)<br>(excludes nurseries under WDRs) | 0.02                | 0.01      | 0.01       |           |
|                            | Open Space (9%)                                     | 0.04                | 0.02      | 0.02       |           |
|                            | Streams & Channels (2%)                             | 0.01                | 0.005     | 0.005      |           |
|                            | Undefined (5%)                                      | 0.02                | 0.01      | 0.01       |           |
|                            | Subtotal – LA (21%)                                 | 0.08                | 0.05      | 0.05       |           |
| MOS<br>(10% of Total TMDL) |   | 0.04                | 0.03      | 0.03       |           |
| Total TMDL                 |   | 0.44                | 0.25      | 0.25       |           |
| Lower Newport Bay          |   |                     |           |            |           |
| WLA                        | Urban Runoff – County MS4 (36%)                     | 0.05                | 0.03      | 0.21       |           |
|                            | Construction (28%)                                  | 0.04                | 0.02      | 0.17       |           |
|                            | Commercial Nurseries (4%)                           | 0.01                | 0.003     | 0.02       |           |
|                            | Caltrans MS4 (11%)                                  | 0.02                | 0.01      | 0.07       |           |
|                            | Subtotal – WLA (79%)                                | 0.11                | 0.07      | 0.47       |           |
| LA                         | Agriculture (5%)<br>(excludes nurseries under WDRs) | 0.01                | 0.004     | 0.03       |           |
|                            | Open Space (9%)                                     | 0.01                | 0.01      | 0.05       |           |
|                            | Streams & Channels (2%)                             | 0.003               | 0.002     | 0.01       |           |
|                            | Undefined (5%)                                      | 0.01                | 0.004     | 0.03       |           |
|                            | Subtotal – LA (21%)                                 | 0.03                | 0.02      | 0.12       |           |
| MOS<br>(10% of Total TMDL) |   | 0.02                | 0.01      | 0.07       |           |
| Total TMDL                 |   | 0.16                | 0.09      | 0.66       |           |

<sup>a</sup> Percentages for WLA (79%) and LA (21%) are applied to the TMDL, after subtracting the 10% MOS from the Total TMDL. Percent WLA and Percent LA add to 100%.

<sup>b</sup> Compliance to be achieved as soon as possible but no later than December 31, 2015.

**Table NB-OCs-10. TMDLs and Allocations (Annual) for San Diego Creek, Upper and Lower Newport Bay (expressed on an “annual” basis for implementation purposes).<sup>a,b</sup>**

|                            |   | Total DDT        | Chlordane | Total PCBs | Toxaphene |
|----------------------------|---|------------------|-----------|------------|-----------|
| Type                       |   | (grams per year) |           |            |           |
| San Diego Creek            |   |                  |           |            |           |
| WLA                        | Urban Runoff – County MS4 (36%)                     | 128.3            |           |            | 1.9       |
|                            | Construction (28%)                                  | 99.8             |           |            | 1.5       |
|                            | Commercial Nurseries (4%)                           | 14.3             |           |            | 0.2       |
|                            | Caltrans MS4 (11%)                                  | 39.2             |           |            | 0.6       |
|                            | Subtotal – WLA (79%)                                | 281.6            |           |            | 4.3       |
| LA                         | Agriculture (5%)<br>(excludes nurseries under WDRs) | 17.8             |           |            | 0.3       |
|                            | Open Space (9%)                                     | 32.1             |           |            | 0.5       |
|                            | Streams & Channels (2%)                             | 7.1              |           |            | 0.1       |
|                            | Undefined (5%)                                      | 17.8             |           |            | 0.3       |
|                            | Subtotal – LA (21%)                                 | 74.8             |           |            | 1.1       |
| MOS<br>(10% of Total TMDL) |   | 40               |           |            | 0.6       |
| Total TMDL                 |   | 396              |           |            | 6         |
| Upper Newport Bay          |   |                  |           |            |           |
| WLA                        | Urban Runoff – County MS4 (36%)                     | 51.8             | 30.1      | 29.8       |           |
|                            | Construction (28%)                                  | 40.3             | 23.4      | 23.2       |           |
|                            | Commercial Nurseries (4%)                           | 5.8              | 3.3       | 3.3        |           |
|                            | Caltrans MS4 (11%)                                  | 15.8             | 9.2       | 9.1        |           |
|                            | Subtotal – WLA (79%)                                | 113.8            | 66.1      | 65.4       |           |
| LA                         | Agriculture (5%)<br>(excludes nurseries under WDRs) | 7.2              | 8         | 7          |           |
|                            | Open Space (9%)                                     | 13.0             | 7.6       | 7.5        |           |
|                            | Streams & Channels (2%)                             | 2.9              | 1.7       | 1.7        |           |
|                            | Undefined (5%)                                      | 7.2              | 4.2       | 4.2        |           |
|                            | Subtotal – LA (21%)                                 | 30.2             | 21.4      | 20.3       |           |
| MOS<br>(10% of Total TMDL) |   | 16               | 9         | 9          |           |
| Total TMDL                 |   | 160              | 93        | 92         |           |
| Lower Newport Bay          |   |                  |           |            |           |
| WLA                        | Urban Runoff – County MS4 (36%)                     | 19.1             | 11.0      | 78.1       |           |
|                            | Construction (28%)                                  | 14.9             | 8.6       | 60.7       |           |
|                            | Commercial Nurseries (4%)                           | 2.1              | 1.2       | 8.7        |           |
|                            | Caltrans MS4 (11%)                                  | 5.8              | 3.4       | 23.9       |           |
|                            | Subtotal – WLA (79%)                                | 41.9             | 24.2      | 171.4      |           |
| LA                         | Agriculture (5%)<br>(excludes nurseries under WDRs) | 2.7              | 1.5       | 10.8       |           |
|                            | Open Space (9%)                                     | 4.8              | 2.8       | 19.5       |           |
|                            | Streams & Channels (2%)                             | 1.1              | 0.6       | 4.3        |           |
|                            | Undefined (5%)                                      | 2.7              | 1.5       | 10.8       |           |
|                            | Subtotal – LA (21%)                                 | 11.2             | 6.4       | 45.5       |           |
| MOS<br>(10% of Total TMDL) |   | 5.9              | 3.4       | 24         |           |
| Total TMDL                 |   | 59               | 34        | 241        |           |

<sup>a</sup> Percentages for WLA (79%) and LA (21%) are applied to the TMDL, after subtracting the 10% MOS from the total TMDL. Percent WLA and Percent LA add to 100%.

<sup>b</sup> Compliance to be achieved as soon as possible but no later than December 31, 2015.

**Table NB-OCs-11. Informational TMDLs and Allocations for San Diego Creek (expressed on a “daily” basis).<sup>a</sup>**

| Category                   | Type  | Chlordane               | Total PCBs |
|----------------------------|---|-------------------------|------------|
|                            |   | (average grams per day) |            |
| San Diego Creek            |   |                         |            |
| WLA                        | Urban Runoff – County MS4 (36%)                     | 0.23                    | 0.11       |
|                            | Construction (28%)                                  | 0.23 0.18               | 0.10 0.09  |
|                            | Commercial Nurseries (4%)                           | 0.18 0.03               | 0.08 0.01  |
|                            | Caltrans MS4 (11%)                                  | 0.03 0.07               | 0.01 0.03  |
|                            | Subtotal – WLA (79%)                                | 0.07 0.50               | 0.03 0.24  |
| LA                         | Agriculture (5%)<br>(excludes nurseries under WDRs) | 0.50 0.03               | 0.22 0.02  |
|                            | Open Space (9%)                                     |                         |            |
|                            |   | 0.03 0.06               | 0.01 0.03  |
|                            | Streams &Channels (2%)                              | 0.06 0.01               | 0.03 0.01  |
|                            | Undefined (5%)                                      | 0.01 0.03               | 0.01 0.02  |
|                            | Subtotal – LA (21%)                                 | 0.03 0.13               | 0.01 0.06  |
| MOS<br>(10% of total TMDL) |   | 0.13 0.07               | 0.06 0.03  |
| Total TMDL                 |   | 0.07 0.70               | 0.03 0.34  |

<sup>a</sup> Percentages for WLA (79%) and LA (21%) are applied to the TMDL, after subtracting the 10% MOS from the Total TMDL.. Percent WLA and Percent LA add to 100%.

**Table NB-OCs-12. Informational TMDLs and Allocations (Annual) for San Diego Creek (expressed on an “annual” basis)<sup>a</sup>.**

| Category                   | Type  | Chlordane        | Total PCBs |
|----------------------------|---|------------------|------------|
|                            |   | (grams per year) |            |
| San Diego Creek            |   |                  |            |
| WLA                        | Urban Runoff – County MS4 (36%)                     | 82.6             | 36.9 40.5  |
|                            | Construction (28%)                                  | 64.3             | 28.7 31.5  |
|                            | Commercial Nurseries (4%)                           | 9.2              | 4.1 4.5    |
|                            | Caltrans MS4 (11%)                                  | 25.2             | 11.3 12.4  |
|                            | Subtotal – WLA (79%)                                | 181.3            | 81.1 88.9  |
| LA                         | Agriculture (5%)<br>(excludes nurseries under WDRs) | 11.5             | 5.1 5.6    |
|                            | Open Space (9%)                                     | 20.7             | 9.2 10.1   |
|                            | Streams & Channels (2%)                             | 4.6              | 2.1 2.3    |
|                            | Undefined (5%)                                      | 11.5             | 5.1 5.6    |
|                            | Subtotal – LA (21%)                                 | 48.2             | 21.5 23.6  |
| MOS<br>(10% of total TMDL) |   | 26               | 11 13      |
| Total TMDL                 |   | 255              | 114 125    |

<sup>a</sup>. Percentages for WLA (79%) and LA (21%) are applied to the TMDL, after subtracting the 10% MOS from the total TMDL. Percent WLA and Percent LA add to 100%.

watershed and pollutant levels decline, some or all of the organochlorine compounds may warrant delisting from the Clean Water Act Section 303(d) list of impaired waters. Again, these TMDLs would need to be revisited accordingly.

Table NB-OCs-13 lists the tasks and schedules needed to implement the organochlorine TMDLs. This Implementation Plan is aimed at identifying actions to accelerate the decline in organochlorine compound concentrations in the watershed, and to augment their natural attenuation. The implementation plan is focused to a large extent on the monitoring and, where necessary, enhanced implementation of Best Management Practices (BMPs) to reduce the erosion and transport to surface waters of fine sediment to which the organochlorine compounds tend to adhere. Many of these BMPs are already in place as the result of existing permits issued by the Regional Board or State Water Resources Control Board for stormwater and construction activities, and/or in response to established TMDLs. The intent is to assure that source control activities are implemented to reduce any active sources of the organochlorine compounds, and in other areas where such actions will be most effective in meeting the TMDL goals. Monitoring and special study requirements are included to provide for TMDL compliance assessment and refinement. Each of the tasks is described below.

**Table NB-OCs-13. Organochlorine Compounds TMDLs Implementation Tasks and Schedule**

| Task                           | Description   | Compliance Date – As Soon As But No Later Than   |
|--------------------------------|---|--|
| <b>PHASE I IMPLEMENTATION</b>  |   |  |
| 1                              | Revise existing WDRs and NPDES permits:<br><i>Commercial Nursery WDRs, MS4 Permit, Other NPDES Permits</i>  | Upon State approval of BPA and permit renewal  |
| 2                              | a. Develop proposed agricultural BMP and monitoring program to assess and control OCs discharges.<br>b. Implement program   | a. (3 months after State approval of BPA)<br>b. Upon Regional Board approval   |
| 3                              | a. Identify responsible parties for open space areas<br>b. Develop proposed monitoring program to assess OCs inputs from open space areas<br>c. Implement proposed monitoring program   | a. (1 month after State approval of BPA)<br>b. 2 months after notification of responsible parties<br>c. Upon Regional Board approval |
| 4                              | Implement effective sediment and erosion control BMPs for management of fine particulates on construction sites:<br>Regional Board:<br>a. Develop SWPPP Improvement Program<br>b. Conduct outreach/training programs<br>MS4 permittees:<br>c. Revise planning processes as necessary to assure proper communication of SWPPP requirements<br>d. Evaluate/implement BMPs effective in reducing/eliminating organochlorine discharges | a. (Upon State approval of BPA)<br>b. (Two months of State approval of BPA)<br>c and d: Upon appropriate revision of the MS4 permit  |
| 5                              | Evaluate sources of OCs; develop and implement BMPs accordingly   | Upon appropriate revision of the MS4 permit  |
| 6                              | Evaluate feasibility and mechanisms to fund future dredging operations within San Diego Creek, Upper and Lower Newport Bay  | Submit feasibility/funding report within (3 years after BPA approval)  |
| 7                              | Develop workplan to meet TMDL implementation requirements, consistent with an adaptive management approach  | Workplan due (3 months after BPA approval)   |
| 8                              | Revise regional monitoring program  | (3 months after BPA approval);<br>Annual Reports due November 15   |
| 9                              | Conduct special studies   | As funding allows, and in order of priority identified in Task 7, if applicable  |
| <b>PHASE II IMPLEMENTATION</b> |   |  |
| 10                             | Review TMDLs, including numeric targets, WLAs and LAs; delist or revise TMDLs pursuant to established Sediment Quality Objectives, new data, and results of special studies   | No later than (5 years from State approval of BPA)   |

**Table NB-OCs-14. Existing NPDES Permits and WDRs Regulating Discharges in the Newport Bay Watershed**

| No. | Permit Title  | Order No.   | NPDES No. |
|-----|---|---|-----------|
| 1   | Waste Discharge Requirements for the United States Department of the Navy, Former Marine Corps Air Station Tustin, Discharge to Peters Canyon Wash in the San Diego Creek/Newport Bay Watershed   | R8-2006-0017  | CA8000404 |
| 2   | Waste Discharge Requirements for the County of Orange, Orange County Flood Control District and the Incorporated Cities of Orange County within the Santa Ana Region - Areawide Urban Storm Water Runoff - Orange County (MS4 permit)                         | R8-2002-0010  | CAS618030 |
| 3   | General Waste Discharge Requirements for Discharges to Surface Waters that Pose an Insignificant (de minimus) Threat to Water Quality   | R8-2003-0061 as amended by R8-2005-0041 and R8-2006-0004  | CAG998001 |
| 4   | General Waste Discharge Requirements for Short-term Groundwater-Related Dischargers and De Minimus Wastewater Discharges to Surface Waters Within the San Diego Creek/Newport Bay Watershed   | R8-2004-0021  | CAG998002 |
| 5   | General Groundwater Cleanup Permit for Discharges to Surface Waters of Extracted and Treated Groundwater Resulting from the Cleanup of Groundwater Polluted by Petroleum Hydrocarbons, Solvents and/or Petroleum Hydrocarbons mixed with Lead and/or Solvents | R8-2002-0007, as amended by R8-2003-0085 and R8-2005-0110 | CAG918001 |
| 6   | Waste Discharge Requirements for City of Tustin's 17th Street Desalter  | R8-2002-0005  | CA8000305 |
| 7   | Waste Discharge Requirements for City of Irvine, Groundwater Dewatering Facilities, Irvine, Orange County,  | R8-2005-0079  | CA8000406 |
| 8   | Waste Discharge Requirements for Bordiers Nursery, Inc.   | R8-2003-0028  |           |
| 9   | Waste Discharge Requirements Hines Nurseries, Inc.  | R8-2004-0060  |           |
| 10  | Waste Discharge Requirements for El Modeno Gardens, Inc., Orange County   | R8-2005-0009  |           |
| 11  | Waste Discharge Requirements for Nakase Bros. Wholesale Nursery, Orange County  | R8-2005-0006  |           |

## **Phase I Implementation**

### **Task 1: WDRs and NPDES Permits**

The Regional Board shall review and revise, as necessary, existing NPDES permits and/or WDRs to incorporate the appropriate TMDL WLAs, compliance schedules, and monitoring program requirements. These permits are identified in Table NB-OCs-14. The appropriate TMDL WLAs, compliance schedules and monitoring program requirements shall be included in new NPDES permits/WDRs. Provisions will be included in all new and renewed NPDES permits and WDRs to specify that, during Phase I implementation, permit compliance will be based upon iterative implementation of effective BMPs to manage the discharge of fine sediments containing organochlorine compounds, along with monitoring to measure BMP effectiveness. Permit revisions shall be accomplished as soon as possible upon approval of the Basin Plan amendment. Given Regional Board resource constraints and the need to consider other program priorities, permit revisions are likely to be tied to renewal schedules.

For commercial nurseries covered under existing WDRs, revisions of these WDRs shall address the following identified needs:

- (1) Evaluation of sites to determine/verify potential storm water and nonstorm water discharge locations;
- (2) Evaluation of current monitoring programs and methods of sampling and analysis for consistency with other monitoring efforts in the watershed;
- (3) In cooperation with U.C. Cooperative Extension, evaluation of BMPs for adequacy and implementation of the most effective BMPs to reduce/eliminate the discharge of potentially-contaminated fine sediments in both storm water and non-storm water discharges;
- (4) Monitoring to better quantify nursery runoff as a potential source of organochlorine compounds and to assure that load reductions are achieved; and
- (5) Based on the results of the preceding tasks, development of a workplan to be submitted within one month of the effective date of these TMDLs that identifies: (a) the BMPs implemented to date and their effectiveness in reducing fine sediment and organochlorine compound discharges; (b) the adequacy and consistency of monitoring efforts, and proposed improvements; (c) a plan and schedule for implementation of revised BMPs and monitoring protocols, where appropriate. It is recognized that most nursery operations are likely to be of very limited duration due to the expiration of land leases. The workplan shall identify recommendations for BMP and monitoring improvements that are effective, reasonable and practicable, taking this consideration into account. This workplan shall be implemented upon approval by the Regional Board Executive Officer.

Revisions to the Municipal Separate Storm Sewer System (MS4) permit (R8-2002-0010, NPDES No. CAS618030) and monitoring program shall address the monitoring and BMP-related tasks identified below, as appropriate. These include: evaluation of discharges of organochlorine compounds from open space areas (Task 3); oversight and implementation of construction BMPs (Task 4); organochlorine compound source evaluations (Task 5); assessment of dredging feasibility and identification of a funding mechanism (Task 6); and, revision of the regional monitoring program (Task 8).

NPDES permits that regulate discharges of ground water to San Diego Creek or its tributaries shall be reviewed and revised as necessary to require annual (at a minimum) monitoring, using the most sensitive analytical techniques practicable, to analyze for organochlorine compounds in the discharges. If organochlorine compounds are found to be present, the dischargers shall be required to evaluate whether and to what extent the discharges would cause or contribute to an exceedance of wasteload allocations and to implement appropriate measures to reduce or eliminate organochlorine compounds in the discharges. New NPDES permits issued for these types of discharges shall incorporate the same requirements.

**Task 2: Develop and Implement an Agricultural BMP and Monitoring Program**

Apart from certain nurseries, agricultural operations in the watershed are not currently regulated pursuant to waste discharge requirements. The SWRCB's "Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program" (Nonpoint Source Policy) (2004) requires that all nonpoint source dischargers be regulated under WDRs, waivers of WDRs, Basin Plan prohibitions, or some combination of these three administrative tools. Board staff is developing recommendations for an appropriate regulatory approach to address agricultural discharges. It is expected that the Regional Board will be asked to consider these recommendations and to approve a regulatory approach in late 2007.

In the interim, agricultural operators shall identify and implement a monitoring program to assess OCs discharges from their facilities, and identify and implement a BMP program designed to reduce or eliminate those discharges. The proposed monitoring and BMP program shall be submitted as soon as possible but no later than *(3 months from State approval of this Basin Plan Amendment (BPA))*. These monitoring and BMP programs will be components of the waste discharge requirements or conditional waiver of waste discharge requirements that Board staff will recommend to implement the Nonpoint Source Policy. Load allocations identified in these TMDLs will also be specified in the WDRs/waiver, with a schedule of compliance.

It is recognized that most agricultural operations are expected to be of very limited duration due to the expiration of land leases. The monitoring and BMP programs proposed by the agricultural operators should include recommendations that are



effective, reasonable and practicable, taking this consideration into account. The BMP and monitoring programs shall be implemented upon approval by the Regional Board. The BMP and monitoring programs may be implemented individually or by a group or groups of agricultural operators. In addition, these BMP/monitoring programs may be coordinated with the development of a watershed-wide workplan (see Task 7).

**Task 3: Identify Parties Responsible for Open Space Areas; Develop and Implement an OCs Monitoring Program to Assess Open Space Discharges**

Nonpoint source discharges from open space are also subject to State regulation. During Phase I of these TMDLs, sufficient data shall be collected by the responsible parties (e.g., County, private land owners) to determine whether discharges of OCs from designated open space, as well as discharges resulting from erosion in and adjacent to unmodified streams, are causing or contributing to exceedances of water quality objectives and/or impairment of beneficial uses of San Diego Creek and Newport Bay. With the assistance of the stakeholders, Regional Board staff will identify the responsible parties as soon as possible but no later than one month from State approval of this BPA. Board staff will notify the identified responsible parties of their obligation to propose an organochlorine compound monitoring program within two months of notification. The monitoring program shall be implemented upon Regional Board approval. This program may be coordinated with the development of a watershed-wide workplan (see Task 7). The Regional Board will consider whether WDRs or a WDR waiver is necessary and appropriate, based on the monitoring results. These results will also inform future review and revisions of these TMDLs.

**Task 4: Develop and Implement Appropriate BMPs for Construction Activities**

Currently, all construction activities in the watershed are regulated under the State Water Resource Control Board's (SWRCB) General Permit for Discharge of Storm Water Runoff Associated with Construction Activity (Order No. 99-08-DWQ, NPDES No. CAS000002; the "General Construction Permit"), and/or the MS4 NPDES permit. The requirements of these permits and an iterative, adaptive-management BMP approach, coupled with monitoring, are the foundation for meeting the TMDL WLAs for construction.

To assure that effective construction BMPs are identified and implemented, program improvements are needed in the following areas: (a) Storm Water Pollution Prevention Plans (SWPPPs) prepared in response to the General Construction Permit must include supporting documentation and assumptions for selection of sediment and erosion control BMPs, and must state why the selected BMPs will meet the Construction WLAs for the organochlorine compounds; (b) SWPPP provisions must be rigorously implemented on construction sites; (c) sampling and analysis for the organochlorine pesticides and PCBs in storm and nonstorm discharges containing sediment from construction sites is necessary to determine

the efficacy of BMPs, as well compliance with the construction WLAs; sampling and analysis plans must be included in SWPPPs; (d) additional BMPs, including advanced treatment BMPs, must be evaluated to determine those most appropriate for reducing or eliminating organochlorine compound discharges from construction sites (e.g., BMPs effective in control of fine particulates); (e) outreach and training are necessary to communicate these SWPPP requirements and assure their effective implementation; and (e) enforcement of the SWPPP requirements is necessary.

To address these program improvements, Regional Board staff shall develop a SWPPP Improvement Program that identifies the Regional Board's expectations with respect to the content of SWPPPs, including documentation regarding the selection and implementation of BMPs, and a sampling and analysis plan. The Improvement Program shall include specific guidance regarding the development and implementation of monitoring plans, including the constituents to be monitored, sampling frequency and analytical protocols. Accordingly, the SWPPP Improvement Program shall be completed by (*the date of State approval of this BPA*). No later than two months from completion of the Improvement Program, Board staff shall assure that the requirements of the Program are communicated to interested parties, including dischargers with existing authorizations under the General Construction Permit, and provide training as necessary. Existing, authorized dischargers shall revise their project SWPPPs as needed to address the Program requirements within three months of State approval of these TMDLs. Upon completion of needed outreach and training concerning the requirements of the SWPPP Improvement Program, SWPPPs that do not adequately address the Program requirements shall be considered inadequate and enforcement shall proceed accordingly.

The MS4 permit shall be revised as needed to assure that the permittees communicate the Regional Board's SWPPP expectations, based on the SWPPP Improvement Program, with the Standard Conditions of Approval. The MS4 permittees shall conduct studies to evaluate BMPs that are most appropriate for reducing or eliminating organochlorine compound discharges from construction sites (e.g., fine particulates), including advanced treatment BMPs. MS4 Permittees and Co-permittees shall include these BMPs in the Orange County Stormwater Program Construction Runoff Guidance Manual. Implementation of these MS4 permittee requirements shall commence upon approval of an appropriately revised MS4 permit.

**Task 5: Evaluate Sources of OCs to San Diego Creek and Newport Bay; Identify and Implement Effective BMPs to Reduce/Eliminate Sources**

Based on the regional monitoring program being implemented by the MS4 permittees and/or on the results of other monitoring and investigations, the MS4 permittees shall conduct source analyses in areas tributary to the MS4 demonstrating elevated concentrations of OCs. Based on mass emissions monitoring (described below) and source analysis, the permittees shall implement

additional/enhanced BMPs as necessary to ensure that organochlorine discharges from significant land use sources to surface waters are reduced or eliminated.

The permittees shall develop and implement a collection program for all banned OC pesticides and PCBs. This type of program has had demonstrated success in other geographic areas in collecting and disposing of banned pesticides. Residents and businesses in the watershed may have stored legacy pesticides that could be collected through such a program; if this is the case, this task would prevent future use and improper disposal of these banned pesticides.

Implementation of these requirements shall commence upon approval of an appropriately revised MS4 permit.

**Task 6: Evaluate Feasibility and Mechanisms to Fund Future Dredging Operations**

Because large-scale erosion and sedimentation primarily occurs during large storm events, traditional BMPs may have limited success in reducing/eliminating the discharge of potentially-contaminated sediments to receiving waters during wet weather. In such cases, dredging within Newport Bay and/or San Diego Creek may be the most feasible and appropriate method of reducing OCs loads in these waters. However, the feasibility and effectiveness of dredging projects in removing OCs would require careful consideration, since dredging may or may not expose sediments with higher concentrations of OCs. Financing of such projects is also a significant consideration.

Entities discharging potentially contaminated sediment in the watershed shall analyze the feasibility of dredging to achieve water quality standards, and shall identify funding mechanisms for ensuring that future dredging operations can be performed, as necessary, within San Diego Creek, Upper and Lower Newport Bay. A report that presents the results of this effort shall be submitted no later than (*three years from the date of State approval of this BPA*). This evaluation may be coordinated with the development of a watershed-wide workplan (see Task 7).

**Task 7: Develop a Workplan to Meet TMDL Implementation Requirements, Consistent with an Adaptive Management Approach**

These TMDLs are to be implemented within an adaptive management framework, with compliance monitoring, special studies, and stakeholder interaction guiding the process over time. Information obtained from compliance monitoring will measure progress toward achievement of WLAs and LAs, potentially leading to changes to TMDL allocations; ongoing investigations and recommended special studies, if implemented, may provide information that leads to revisions of the TMDLs, adjustments to the implementation schedule, and/or improved implementation strategies. Thus, implementation of the TMDLs is expected to be an ongoing and dynamic process.

Substantial efforts are now being made by many stakeholders in the watershed to address established permit and/or TMDL requirements for BMP implementation and monitoring and to conduct special investigations to understand and improve water quality conditions in the watershed. For example, Southern California Coastal Water Research Project (SCCWRP), the University of California, and the County of Orange are all involved in studies aimed at improving the understanding of causes of sediment toxicity, measuring mass emissions, developing sediment quality objectives, analyzing sources, and other relevant projects. The Irvine Company, in conjunction with other watershed stakeholders, is implementing a workplan to gain a better understanding of biologic effects of the organochlorine compounds, determining appropriate screening values, and determining the cause of sediment toxicity in the watershed. The framework exists to develop a comprehensive watershed plan for addressing water quality, not only as it relates to the organochlorine compounds, but on a larger scale that encompasses all sources of water quality impairment.

In light of this established framework, many of the preceding implementation tasks may be accomplished most effectively and efficiently through the development and implementation of a watershed-wide workplan, developed by interested stakeholders and approved by the Regional Board. The purpose of the workplan would be to (1) review implementation requirements and integrate TMDL implementation tasks with those already conducted in response to other programs (e.g., permits, TMDLs); (2) prioritize implementation tasks; (3) develop a framework for implementing the tasks, including a schedule and funding mechanism; (4) implement tasks; and (5) make recommendations regarding needed revisions to the TMDLs. Stakeholders interested in pursuing this approach are required to commit to their participation in the development and implementation of the workplan by *(one month of the State approval of these TMDLs)*. A proposed workplan is to be submitted to the SARWQCB within *(3 months of State approval of these TMDLs)*. Implementation of the workplan shall commence upon approval by the Regional Board. To the extent that there are any conflicts between the individual tasks and schedules identified above, and the prioritized plan and schedule identified in the workplan, the workplan

would govern implementation activities with respect to the stakeholders responsible for workplan development and implementation.

**Task 8: Revise Regional Monitoring Program**

The County of Orange, as Principal Permittee under the County's MS4 permit, oversees the countywide monitoring program. Implementation of the monitoring program is supported by funds shared proportionally by each of the Permittees. Some monitoring requirements identified in this implementation plan are already reflected in the current program.

By (3 months from State approval of BPA), the MS4 permittees shall: (1) document each of the current monitoring program elements that addresses the monitoring requirements identified in the preceding tasks; and, (2) revise the monitoring program as necessary to assure compliance with these monitoring requirements.

Review of/revisions to the monitoring program shall address:

- (1) Estimation of mass emissions of chlordane, DDT, PCBs and toxaphene.
- (2) Determination of compliance with MS4 wasteload allocations for Upper and Lower Newport Bay, and of status of achievement with the informational wasteload allocations for San Diego Creek for chlordane and PCBs.
- (3) Assessment of temporal and spatial trends in organochlorine compound concentrations in water, sediment and tissue samples.
- (4) Semi-annual sediment monitoring in San Diego Creek and Newport Bay. Measurements of sediment chemistry in these waters should be evaluated with respect to evidence of biological effects, such as toxicity and benthic community degradation.
- (5) Evaluation of organochlorine bioaccumulation and food web biomagnification
- (6) Assessment of the degree to which natural attenuation is occurring in the watershed.

Accurately quantifying the very small mass loads that are allowable under these TMDLs will be very challenging; analytical strategies for quantifying loads of the organochlorine compounds must be carefully explored.

Revisions to the monitoring program shall take into consideration the following recommendations provided by members of the Organochlorine Compounds TMDL Technical Advisory Committee (TAC):

- (1) The analytical parameters measured need to be established for each matrix of interest (e.g., sediment, tissue, ambient water). The representative list of compounds to be measured needs to be identified (e.g., what chlordane compounds will be measured and summed to represent "total chlordane;" will PCB congeners be measured and summed or will Aroclors?).

- (2) Data quality will need to be consistent with the State's Surface Water Ambient Monitoring Program (SWAMP). Detection limits, accuracy and precision of analytical methods should be adequate to assure the goals of the monitoring efforts can be achieved.
- (3) Bioaccumulation/biomagnification in high trophic level predators may not immediately respond to load reductions; appropriate time scales and schedules for monitoring that are supported by empirical data and/or modeling should be established.
- (4) Sentinel fish and wildlife species should be selected for monitoring based on home range, life history, size and age.

### **Task 9: Conduct Special Studies**

The following special studies should be conducted, in addition to the studies already underway in the watershed. This list is based, in part, on recommendations of the technical advisory committee for the organochlorine compounds TMDLs. These studies will be implemented as resources become available, and the results will be used to review and revise these TMDLs. Stakeholder contributions to these investigations are encouraged and would facilitate review of the TMDLs.

- (1) Evaluation of sediment toxicity in San Diego Creek and tributaries, and Upper and Lower Newport Bay.

Previous studies have included Toxicity Identification Evaluations (TIEs) that have yielded inconclusive results as to the cause of toxicity in Newport Bay. Sediment toxicity within San Diego Creek is not well-documented or well-understood. There is evidence that pyrethroid compounds may be a significant contributor. In determining the extent to which nonpolar organic compounds are causing or contributing to sediment toxicity, the differential contribution of both the organochlorine compounds and pyrethroids should be determined to assure that control actions are properly identified and implemented. Monitoring should be performed year-round at multiple locations within San Diego Creek and Newport Bay (to encompass spatial and temporal variability), and should include various land use types in order to quantify the relative contributions from various sources.

- (2) Refinement of sediment and tissue targets.

A study is being conducted by the San Francisco Estuary Institute to develop indicators and a framework for assessing the indirect effects of sediment contaminants. The objective is to provide methodology that will assist in evaluating indirect adverse biological effects for bioaccumulative pollutants (e.g. due to food web biomagnification), as part of the overall goal of developing statewide sediment quality objectives. Newport Bay is being used as a case study to show how the proposed methodology could be implemented on a screening level. Multiple lines of evidence will be evaluated to determine impacts of organochlorine pesticides and PCBs to humans and wildlife. A conceptual foodweb model will be developed, and

sensitive wildlife receptors will be identified. Empirical field data and a steady-state food web model will be used to calculate bioaccumulation factors for the organochlorine compounds. The bioaccumulation factors will be combined with effects thresholds to identify sediment concentrations that are protective of target wildlife and humans.

Once completed by SFEI, a thorough evaluation of the Newport Bay case study needs to be initiated, and any additional analyses required for a more in-depth risk analysis should be identified and completed. Protective sediment and tissue targets for indirect effects to humans and wildlife should be developed by the time the TMDLs are re-opened. Furthermore, once TIEs have identified the likely toxicant(s) responsible for sediment toxicity in San Diego Creek and Newport Bay (direct effects), field and laboratory studies should be conducted in order to determine bioavailability and the dose-response relationship between sediment concentrations and biologic effects.

- (3) Evaluation of regional BMPs (e.g., constructed wetlands and sediment detention basins) for mitigating potential adverse water quality impacts of sediment-associated pollutants (e.g., OCs, pyrethroids).

Large-scale, centralized BMPs such as constructed wetlands and storm water retention basins may be more effective than project-level BMPs in reducing adverse environmental impacts of sediment-borne pollutants. Regional BMPs are either being planned or are in place within the watershed (e.g., IRWD NTS). Their potential effectiveness for capturing the organochlorine compounds and mitigating impacts needs to be evaluated.

- (4) Improvement in linkage between toxaphene measured in fish tissue and toxaphene in bed sediments.

The toxaphene impairment listing for San Diego Creek is based on fish tissue exceedances that have no measured linkage with toxaphene in sediments. While sediment is the primary TMDL target for these TMDLs, toxaphene is usually not detected in sediment. Because of its chemical complexity, there is a large degree of analytical uncertainty with measurements of toxaphene in environmental samples that use standard methods (e.g., EPA Method 8081a), especially at low levels. Confirmations of toxaphene in fish and sediment samples in San Diego Creek (and possibly Newport Bay) using other techniques (e.g., GC-ECNI-MS or MS/MS) is recommended.

- (5) Evaluation of relative importance of continuing OCs discharges to receiving waters through erosion and sedimentation processes, versus recirculation of existing contaminated bed sediments, in causing beneficial use impairment in San Diego Creek and Newport Bay.

This study should allow for determination of the most effective implementation strategies to reduce organochlorine compounds in the MS4 and other receiving waters.

## **Phase II Implementation**

### **Task 10: TMDL Reopener**

These TMDLs will be reopened no later than *(five (5) years following State approval of this BPA)* in order to evaluate the effectiveness of Phase I implementation. At that time, all new data will be evaluated and used to reassess impairment, BMP effectiveness, and whether modifications to the TMDLs are warranted. If Phase I BMPs have been shown to be ineffective in reducing levels of organochlorine compounds, then more stringent BMPs may be necessary during Phase II implementation.

Implementation of these TMDLs and the schedule for implementation are very closely tied with other TMDLs that are currently being implemented in the watershed. The sediment TMDL allowable load for San Diego Creek was the basis for calculating organochlorine compound loading capacities. The sediment TMDL is scheduled for revision in 2007; changes to the sediment TMDLs will likely necessitate changes to these organochlorine compounds TMDLs as well.